

Structure comprising a thin layer composed of material containing conductive and isolation regions and method for manufacturing the structure

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Abstract of EP0994503

The structure comprises a thin layer (2) integrated with a support (3) and comprising a semiconductor material made insulating by hydrogen and/or helium ion implantation with the exception of at least one zone permitting an electrical connection through the thickness of the thin layer (2). Production of the thin layer having at least one vertical electrical connection through its thickness and comprising a conducting or semiconducting material whose electrical properties are susceptible to change when it is subjected to ionic implantation comprises: (a) masking one face (5) of a substrate (1) comprising the material using a mask (4) comprising micro-elements and defining at least one masked zone whose size does not exceed a limiting value determined for the material, the limiting value being necessary to allow cleavage of the substrate during the last stage of cleavage; (b) hydrogen or helium ion implantation of the substrate across its masked face, to create a layer of micro-cavities defining the thin layer in the unmasked volume of the substrate and at a depth approaching the depth of penetration of the ion species; (c) removal of the mask (4); and (d) cleavage of the substrate at the level of the layer with microcavities in order to obtain the objective thin layer. Independent claims are given for: (i) application of the process for production of a thin layer made of SiC, GaAs or InP on a support made of silicon; and (ii) a structure comprising a thin film of a conductor or semiconductor and made insulating by ion implantation with the exception of at least one zone permitting an electrical connection through the thickness of the

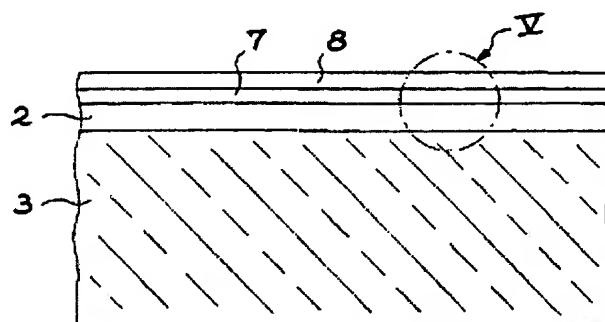


FIG. 4

thin layer (2). The thin layer (2) is integrated with the support by an intermediate conducting layer of metal, preferably palladium, associated with deposition of an anchoring conducting layer comprising successive deposition of titanium, nickel and gold, or by an indium-based solder.

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